

Mechanism for the Prevention of Spontaneous Emission Events in the Infrared Range in Heated Objects

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Introduction

The tendency of objects above a certain temperature to emit substantial infrared light is currently believed to be unavoidable, with few options being available to mask the infrared signature of aircraft engines, the warmth of the engine blocks of vehicles traveling over land, or the exhaust of a missile.

Tactics such as using variable-position mirrors to redirect IR signatures away from known positions of IR surveillance satellites have been demonstrated to have gone from marginally effective to sheerly ineffective as increasing numbers of IR detection satellites of exquisite sensitivity have been fielded by multiple countries, leaving few gaps in the awareness of major powers when it comes to IR-photographic intelligence.

Abstract

A physics-based approach incorporating a combination of materials never before promulgated for the application of IR signature reduction may provide a means of preventing the initial emission of IR light in a heated object (such as a jet engine exhaust or an engine block,) an approach that, if experimentally verified, would have distinct advantages over the mere masking of IR light or its clever redirection with mirrors.

The spontaneous emission of IR light by a heated object, given that it is not (as is widely believed) based upon changes in energy states between electrons moving between shells but rather, the reflection of electron singlets moving in opposing directions to electron triplets, can be prevented by preventing the formation of clusters of electrons known as electron triplets.

Just as (ibid.) LEDs of unprecedented efficiency may be constructed by deliberately bringing about triplet formation in flowing current, triplet formation within a valence shell; ordinarily brought about by an attraction of electrons to a specific portion of that shell resulting from a relative close approach of the positively-charged nucleus to that shell. These close approaches, a natural consequence of high temperature, pull diffuse electrons in the valence shell toward a common point of convergence in much the same manner a gravity guiding balls toward divots in the ground. As explained in a previous publication, these triplets have sufficient magnetic and Coulomb repulsive force to invert the angular momentum of an electron singlet moving in an opposing direction; a process which strips the singlet of much of its mass, converting it into what we call a photon.

Given this premise, triplet formation should logically be preventable through the introduction of vibrational energy in a system of extremely low amplitude and high frequency (matching the thermal oscillatory frequency.)

Two classes of materials; if combined in a metamaterial of molecular granularity in an alternating pattern; would be capable of generating this type of vibrational energy. These two classes of materials are thermoelectric compounds and quartz crystals.

In order to generate vibrational energy, there must be an impelling force. Electrons would constitute that force in this mechanism. The electrons would be generated by the heat's reaction with the thermoelectric compound which would be mosaicized in three dimensions with quartz or a quartz-like crystal which shares quartz's property of briefly storing and subsequently releasing electricity, the primary difference from a standard quartz crystal being that these would pulse at a frequency in the THz range.

Electrons would be volleyed between the TE and the QC elements of the mosaic with these volleys resulting in the generation of vibrational energy of an extremely high frequency. The consequence of this would be that neighboring electron shells would move closer to and then further away from one another several trillion times per second. The mutual repulsion of electrons between the neighboring shells would have the effect of setting orbiting electrons in the valence shell on divergent rather than convergent paths. With each undulation of the nucleus, electrons are initially set on trajectories that would otherwise lead to triplet formation, but in this regime, they would be scattered before their conjunction might become possible.

The overall effect would be that regardless of temperature, an object (or coating) of the aforementioned composition would, despite extremely high temperature, not emit substantial IR light and would therefore be IR-stealth.

Conclusion

The primary reason this mechanism has never before been promulgated is due to the widespread misconception that spontaneous emission is related to leaps of electrons between energy states. This is a good example of a misconception holding back scientific progress as universities shamefully continue to teach this grossly incorrect model of spontaneous emission of IR light to their physics students.

The ability to entirely mask the IR signature of aircraft engines will confer non-trivial strategic advantage to the possessor.